

The Planters' Chronicle.

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THE U. P. A. S. I.

(INCORPORATED)

Contents.

The Scientific Department calls attention to the increasing spread in Coorg of Green Bug, and strongly advises planters to be ready to attack it during the coming hot weather; and uses the emphatic warning: "It is fatal to relax vigilance." The note is most interesting. The Planting Expert, through the kindness of Mr. Bainbridge Fletcher, R. N., the Government Entomologist, is able to publish a list of insects which attack coffee, tea, or rubber.

From the Monthly Bulletin of Agricultural Intelligence and of Plant Diseases we extract a paper entitled "Study of *Coffea Robusta*." Just at this moment it is interesting to note that *corticium javanicum* (produced by *Lecanium viride*) and eel worms seldom or never attack robusta. The greatest precaution must be taken in the interests of all in importing seed. Daily it is becoming more apparent that a Pest Act is necessary in India.

Just when the Annual Meeting is taking place, we are able to publish two letters dealing with the Labour Question, which may or may not (in conjunction with other letters) help the assembled delegates to arrive at some solution of this thorny problem.

"South India" in his opening para. congratulates us on the increasing use made of our columns, and we have only to say, that we hope that these columns will be more widely used. They are open to all and sundry.

An answer from "Sleeping Brother" to "Curer's" letter of 16th, is published, which we hope will bring a fully explanatory reply from him.

A short article on Pepper is reproduced, which shows the advantage of cattle manure over oil cakes. Ground nuts appear to be the best green manure for pepper, and that leaf mulch and leaf mould have beneficial effects.

Almost all the Delegates have arrived for the meeting of 25th and most have called in at the office and helped Mr. Anstead to arrange the Exhibits, which are still continuing to come in.

THE SCIENTIFIC DEPARTMENT, U.P.A.S.I.

Scientific Assistants.—Mr. Jonas, the Scientific Assistant for Coorg who had been at Bangalore occupied upon special work for ten days or so returned to his District on 14th August. He is now occupied with the new outbreaks of Green Bug. Mr. G. N. Frattini, the Scientific Assistant for Mysore, arrived in Bangalore on 11th August and will remain at head quarters till after the Annual Meeting of the U. P. A. S. I. He is engaged upon the checking of fertiliser guarantees in the Laboratory.

Green Bug.—This pest is still increasing its spread in Coorg, and has appeared in a new area despite the monsoon conditions now obtaining. The statement which has several times been made in these notes, that rain alone, however heavy, will not kill it, finds ample confirmation in Coorg. Here it has broken out on new areas during the monsoon, and is bad on one estate which has had 80 inches of rain in two months. Hence it is evident that all mistaken notions that rain is going to kill it entirely must be abandoned, and it is fatal to relax vigilance and cease to take the necessary precautions against the spread of the scale. The more it spreads now, the worse and more general will be the attack during next dry weather.

With regard to the life history of the scale an important point has recently been observed. A young three year old tree with only one young scale on it was marked on 24 June, isolated (the plants round it being sprayed), and kept under observation. On 16 July the tree was covered with Scale and had to be destroyed. Hence under favourable conditions the period from egg to egg is about three weeks only.

Insect Pests in Southern India.—Mr. T. Bainbrigge-Fletcher R. N. the Government Entomologist, has recently issued for private circulation among his colleagues a *List of Insect Pests of Cultivated Plants in Southern India*, and he has very kindly granted us permission to extract from this list the insects affecting Coffee, Tea, and Rubber. In the Preface to the List, Mr. Fletcher says, "this List shows the principal crop pests of Southern India. It must be clearly understood that such a list does not purport to be complete and never can be complete, as new pests are constantly coming to light, but it is intended to serve temporarily the purpose of giving a list (in systematic order) of those insects which are at present known to do damage to crops in Southern India for the benefit mainly of Entomologists in and outside of India. It is hoped to issue illustrated Bulletins on the insect pests of the principal crops as soon as the necessary illustrations can be prepared. A Bulletin on Insect Pests of Paddy is in the press, one on Cotton Pests is written, and others are projected on Pests of Chulam, Mango, Coffee, &c. In the present list the localities given are those in which the various insects are known to occur, but this is not to be taken as meaning that these insects are not to be found in other Districts. "Throughout" means throughout Southern India in all suitable localities in the Plains and Hills. "Plains" means all suitable localities below an elevation of about 4000 feet, above which higher localities are denoted as "Hills." The "crops attacked" are those on which the insects are usually found as Pests, but other plants than those mentioned may be attacked occasionally. Under the head of "remarks" the status of the pest is usually given i.e. whether the particular insect is a major pest regularly causing considerable loss of the crop attacked, or a minor pest of regular occurrence but causing relatively inconsiderable damage. A sporadic pest is one that occurs occasionally but not regularly, and a local pest is one that only does damage in a limited area."

The following Insects in the List are noted as attacking Coffee, Tea or Rubber:—

Name.	Distribution.	Crops attacked.	Remarks.
<i>Coleoptera</i>			
<i>Cerambycidae.</i>			
<i>Batocera rubus</i> , L. ...	Throughout	Hevea Rubber	Minor pest usually
<i>Nyctotrechus quadripes</i> , Cheor...	Hill Districts	Coffee	Major pest
<i>Scolytidae (Ibidae)</i>			
<i>Xyleborus fornicatus</i> , Eich. ...	Travancore	Tea	Minor pest
<i>Lepidoptera</i>			
<i>Arctiidae</i>			
<i>Estigmene lactinea</i> , Cr. ...	Plains	Cumbu, Ragi, Horse-grain and Coffee &c.	Local major pest of Cumbu
<i>Cretonotus gangis</i> , L. ...	Throughout	Groundnut, Lucerne, Coffee &c.	Scarcely a pest
<i>Noctuidae.</i>			
<i>Euroa segetis</i> , Schiff ...	Submontane & Hill districts	Potato, Cabbage, Coffee &c.	Serious garden pest in Hills
<i>Lymantriidae.</i>			
<i>Glene mendosa</i> , Hb. ...	Bellary, Coimbatore and Shevaroy	Castor, Red-grain, Coffee	Minor pest
<i>Nododontidae.</i>			
<i>Statuopus alternus</i> , Wlk. ...	Throughout	Tamarind, Tea	Very rarely a pest
<i>Geometridae.</i>			
<i>Biston suppressaria</i> , Gn. ...	Tea Districts	Tea	Sporadic minor pest
<i>Limacodidae.</i>			
<i>Parasa lepida</i> , Cr. ...	Throughout	Castor, Mango, Coconut, Palmyra, Pepper, Tea &c.	Sporadic major pest
<i>Zeuzeridae.</i>			
<i>Zeuzera coffeae</i> , Nietn. ...	Hills	Coffee, Tea, Sandal	Minor pest
<i>Zygaenidae.</i>			
<i>Heterusia virescens</i> , Butl. ...	Nilgiris Wynaad	Tea	Sporadic serious pest of Tea
<i>Psychidae.</i>			
<i>Clania crameri</i> , Westw. ...	Throughout		do

Name.	Distribution.	Corps attacked.	Remarks.
<i>Tortricidae.</i>			
<i>Homona coffearia</i> , Nicta.	... Tea Districts	Tea	Minor pest sporadically serious
<i>Hepialidae.</i>			
<i>Phassus malabaricus</i> , Mo.	... Nilgiris, Bangalore	Tea (roots) and probably various plants & shrubs	Doubtfully a pest
<i>Rhynchota</i>			
<i>Pentatomidæ.</i>			
<i>Antestia cruciata</i> , Fb.	... Throughout	Coffee	Sporadic serious pest
<i>Capsidæ.</i>			
<i>Helopeltis antonii</i> , Sign.	... Coimbatore. Hills	Tea, Cacao, Cinchona	Sporadic serious pest
<i>Jassidæ.</i>			
<i>Empoasca flavescens</i> , Fb	... Throughout	Castor, Tea	Very minor pest
<i>Coccidæ.</i>			
<i>Dactylopius citri</i> , Risso.	... Throughout	Coffee, Tea, Erythrina, &c.	Occasional serious pest of Coffee
<i>Pulvinaria psidii</i> , Mask.	... Throughout	Mango, Guava, Loquat, Coffee, &c.	Minor pest usually
<i>Lecanium viride</i> , Grn.	... Throughout	Coffee, Guava, Loquat, Cinchona, &c.	Locally very serious pest of Coffee
<i>Lecanium hemisphaericum</i> , Targ.	... Throughout	Tea, Coffee, &c.	Sporadic serious pest of Coffee and Tea
<i>Lecanium nigrum</i> , Nietu.	... Throughout	Hevea, Tea, Coffee, &c.	Usually a minor pest on Rubber
<i>Lecanium oleae</i> , Bern.	... Throughout	Coffee, Castilleja, Rubber, &c.	Minor pest of Coffee
<i>Aspidiotus camelliae</i> , Sign.	... Hills	Tea, Cinchona, &c.	Occasional serious pest of young tea plants
<i>Chionaspis biclavus</i> , Comst.	... Nilgiris	Tea, Cinchona, Coffee	Local minor pest
<i>Hemichionaspis theae</i> , Mark	... Tea Districts	Tea	do
<i>Acrididæ.</i>			
<i>Aularches miliaris</i> , L.	... Probably throughout	Coffee, &c.	Rarely a pest

R. D. A.

STUDY OF COFFEA ROBUSTA.

For some years past, the question of *Coffea robusta* and of its cultural value has been dealt with in all Colonial Agricultural Journals. In this article, the writer has collected all the data, which seem favourable to a large extension of the cultivation of this plant. Already in 1909, he maintained, in a paper contributed to the *Annales du Jardin Botanique de Buitenzorg* (2), and containing an exhaustive bibliography of the cultivated varieties of *Coffea*, that *C. robusta* is not a species, but a variety or form of *Coffea canephora*, indigenous in Central and West Africa.

C. robusta when carefully cultivated, forms a shrub with horizontal or decumbent branches, which at the flowering and fruiting seasons, literally bend beneath the weight of the flowers and fruit. This productivity is one of the characteristics of the variety from the economic standpoint; for no other kinds of cultivated coffee plants bear so many seeds. Another important characteristic which must be dwelt on is its early maturity; it is full bearing long before *C. liberica* and *C. arabica* and before *Hemilea* has developed sufficiently to hinder its fructification to any noticeable extent.

But the success of *C. robusta* is especially due to the fact that it will grow between Heveas and to the economic results obtained by using it as a grafting stock (3).

UNITS OF YIELD.—The yield of this plant is one of the most remarkable; the following table published by the *Jaarboek* of the Department of Agriculture of Java, gives the crop from different coffee plants of the same age and grown under identical conditions:

Java Coffee	...	...	53	to	97	grams
Maragogyne	...	...	14	to	38	"
Moka (small berries)	...	...	27	to	38	"
Moka (large berries)	...	...	118			"
Robusta	...	...	942			"
Quillon	...	...	1020			"
Maragogyne on Quillon	...	...	26			"
" " Robusta	...	...	156			"
Eugenifolia	...	...	20	to	133	"
Lanceifolia	...	...	10			"
Erecta	...	...	43			"
Cochleata	...	...	12			"
Rotundifolia	...	...	40			"
Laurina	...	...	83			"
Unisperma	...	...	20			"
Columnaris	...	...	17			"
Augustifolia	...	...	60			"

The two African varieties, *Quillon* and *Robusta*, are the ones which give the highest yields, while *Maragogyne* grafted on *Quillon* produces 26 grams of seed per tree and on *Robusta* 156 grams per tree, which is a larger crop than any produced by the cultivated varieties formerly grown in Java.

SELECTION. - An interesting question has been raised of late as to the flavour and commercial value of the coffee from the different varieties of coffee plants; this leads to a consideration of the necessity of improving the cultivated species and varieties by means of selection.

This is the more important, contrary to what has been affirmed respecting other species of *Coffea*, and especially by Dr. Von Faber as regards *C. Liberica*, seeing that self-fertilisation never takes place in the group of

Coffea canephora to which *C. robusta* belongs; cross-fertilisation is the invariable rule. This being the case, it is necessary to protect the plant from bad qualities being introduced by strange pollen. Very careful selection is therefore necessary to ensure good returns and, according to Dr. P. S. Cramer, attention must be directed to the following points:--

1. Growth, resistance to fungoid leaf diseases, ramification.
2. Annual production, early ripening of crop, distribution of flowering periods throughout the year.
3. Crops, proportion between good and aborted seeds, thickness of the testa of the fruit.
4. Shape, colour, size of the berries.

All selection work, however, presupposes a knowledge of the forms to be adopted and the value of their produce; unfortunately much confusion still prevails in these matters, as is shown by the different opinions summarized by the writer as to the determination and classification of the various kinds of coffee cultivated.

Mr. Wurth, of the Special Coffee Station at Java, divides the cultivated varieties of Coffee plants into 3 groups of which the types are *C. arabica*, *C. liberica* and *C. robusta*:

Arabica: *congensis*, *stenophylla*.

Liberica: *aboccuta*, *excelsa*.

Robusta: *canephora*, *Quillon*, *Uganda*.

Mr. Wildeman, on the contrary, considers *robusta* as a variety of *canephora*, and *Quillon* as identical with *C. canephora* var. *Sankaruncensis* which together with *robusta* and *Laurentii* are a sort of *canephora* exported with the latter varieties from the Congo. At all events, if *Coffea arabica* seems to be variable, this is equally the case with *C. canephora*, and it is impossible yet to be sure whether the *Quillon* variety grown in Java is actually the *Konilouensis* (Pierre), variety of *Canephora* or another African variety of the same species, or even a new local form derived from a plant introduced into Java. All these questions, which are of great scientific and practical importance, still remain to be solved.

CULTURAL EXPERIMENTS. In Java, the answer to these problems is being sought by means of comparative experiments of the greatest interest. The results of Dr. Cramer's study of the proportion of fresh fruit to the berries ready for sale are all in favour of the *canephora* group and therefore of *Coffea robusta*, seeing that 4 or 5 lbs. of its fresh fruit furnish, 1 lb. of berries, which in the case of *liberica* and *Coffea arabica* 7.85 to 15 lbs. and 5 to 6 lbs respectively are necessary to supply the same weight of coffee berries ready for the market.

Other experiments undertaken for the purpose of ascertaining whether the *Quillon* variety was suitable for planting on the sandy soils of Kloet in Java showed that:

1. In the majority of cases *Quillon* thrives as well as *robusta* in the Kloet nurseries and it is only very rarely more backward in growth than the latter.
2. Shortly after being planted out, both varieties develop equally well.
3. Until its second year, the *Quillon* variety grows a little less rapidly than *robusta* on the Kloet soil, but after this period it makes up for lost time and becomes as vigorous as the latter. Their value consists in the uniformity of the type.

4. Under the present conditions, the yield of *C. Quillon* on the soils of Kloet is less than that of *C. robusta* when grown in the same circumstances.

5. In the district in question *C. Quillon* is of less cultural value from a general point of view than *C. robusta*.

Other cultural experiments have, however, not given the same results. When the *Uganda*, *Robusta* and *Quillon* varieties are planted so as to compare them with each other and using *Leucocna glauca* as a shade tree if they are cut at a height of 5 feet and placed 10 x 10 ft. apart, they give the following amount of coffee ready for the market.

Uganda	...	10'44 piculs per bouw or about	800 lbs. per acre
Robusta	...	16'60 " " "	1,250 " " "
Quillon	...	21'21 " " "	1,000 " " "

CULTURAL METHODS AND SHADE PLANTS.—It is necessary to choose, by means of preliminary experiments, the variety of coffee to be cultivated; this, however, is not all, for the cultural methods most suitable to the given variety must be selected and the variety of shade plant to be used. The experiments of M. Boon in the experimental plantations of the Dutch East Indian Government at Bangalan, Java, show that the yield of the same variety varies with the shade plant employed.

Ratio of yields of cultivated coffee plants grown under the following shade plants:—

<i>Solanum grandiflorum</i>	...	...	1.39
<i>Adenanthera pavonina</i>	...	...	1.82
<i>Colesalpinia arborea</i>	...	...	2.17
<i>Acacia tomentosa</i>	...	...	2.43
<i>Hevea brasiliensis</i>	...	...	2.77
<i>Albizia moluccana</i>	...	...	2.82
<i>Pithecolobium Saman</i>	...	...	3.06
<i>Grevillea robusta</i>	...	...	3.49
<i>Erythrina lithosperma</i>	...	...	4.10
<i>Leucocna glauca</i>	...	...	4.75

EXTENSION AND PROGRESS OF THE CULTIVATION OF *C. ROBUSTA*.

In order to obtain an idea of the popularity enjoyed in Java by coffee plants belonging to the *caneophora* group, it is only necessary to consult statistics on the subject and especially those compiled by the Agricultural Syndicate of the Dutch East Indies. According to the latter, 24 521 000 plants of *C. robusta* have been planted in the 4 years from 1907 to 1911. The statistics of yield and of plantation communicated at a meeting held at Malang in May 1912, gave the following figures for plantations:

	1911 Crop.	1912 Estimate.	Plantations, 1911-1912.
<i>C. robusta</i> and spices of the same group	54,685 cwt.	94,312 cwt.	4,686,542 trees
Java	42,873 "	74,460 "	...
<i>C. liberica</i>	15,616 "	9,164 "	12,150 "
Hybrid	1,763 "	3,445 "	80,476 "

These few figures, although incomplete, seem to justify the opinion expressed by Prof. Treub, late Director of the Buitenzorg Botanic Gardens, that soon 60000 tons of Javanese Coffee of Congo origin may be expected on the market. They also show very clearly the progress made in the cultivation of the *canephora* species. The same is affirmed to be the case in Madagascar, where the *canephora* variety is preferred to the *liberica* on account of its early and abundant crops, of which the commercial value exceeds by 8s. or 12s. per *cwt.* that of the *liberica* coffee from the same district.

Nevertheless, the cultivation and exploitation of the coffee plant in Africa have made but little progress in comparison with the extension of the cultivation of coffee from the centre of Africa, which has taken place in India and the Far East. It should, however, be added that coffee is increasingly grown in some of the German colonies in Africa.

The area under coffee in 1909 was estimated at 1976 acres in Usambara, and the amount of coffee which could be obtained in Massai was reckoned at 2.2 lbs. per tree, 400 trees being planted per acre.

DISEASES AND ENEMIES.—Dr. H. Morstatt, of the Amani Botanical Station has published a long list of the fungoid and insect pests which attack the coffee plants of this colony.

Hemiteia is now found in all the tropical regions of the globe and though *C. robusta* is more resistant than the other species it seems not to be completely immune from this parasite. In 1903-04, Mr. Laurent brought back from the Congo numerous specimens of the *canephora* and *robusta* groups of which the branches and leaves were attacked by this parasite. Other diseases of *C. robusta* have been recorded.

Stem Canker due probably to a fungus, *Asospora Coffea*, seems to have been able to develop because the plantations were at first very thick, but its extension has been hindered by planting the shrubs further apart and by burning all infected individuals.

Cercospora coffeicola and *Xyleborus*, the Boeck of the Indians, do more damage on the *robusta* than on the *Java* and *liberica* groups; but *Corticium javanicum*, the Djamoer-oepas of the Indians (produced by *Lecanium viride*), and eel-worms seldom or never attack *robusta*.

All these considerations show how important it is not to send seeds from Africa to new plantations without having taken all the precautions necessary to the interests of the planters.

COMMERCIAL VALUE OF THE PRODUCT.—It is objected that the berries of the *robusta* group and of other African coffee are small in size and inferior in flavour; but the continually increasing quantities of this coffee sold in Holland and the satisfactory prices they fetch show that the public is beginning to appreciate them. No objections will be made to the size of the berries when by means of careful cultivation and especially of right preparation, a coffee is obtained equal in flavour to the (old) *Java* and Arabian coffees.

(Monthly Bulletin of Agricultural Intelligence and of Plant Diseases)

April 1913,

CORRESPONDENCE.

The Managing EDITOR,
The Planters' Chronicle,
 Bangalore.

Dear Sir.—I must congratulate you on the increase of correspondence on practical points in connection with the Planting Industry, and hope now that a start has been made, it will lead to further letters from individual planters.

If this is kept up, we are likely to get a lot of valuable information, and the interest in the *Chronicle* will be greatly enhanced.

Last week, we had quite a good letter from Mr. Barnard and he touches on one or two interesting points.

He starts with the existing state of combination in the planting community but I am more inclined to agree with "South India" that combination amongst us is *non est* and it is time the Planters of Southern India awakened to the fact.

His next point is 'the almost complete absence of practical suggestions, results and records of experiments and general treatment of the really important matters in planting, to which I can only say 'hear, hear.'

We have the services of an eminent Scientist who is willing to do all he can for us—comes round our Districts and recommends certain experiments in manuring which we all gaily agree to carry out with the result, that at the end of the period, some one has gone home or statistics have not been carefully kept and the results are *nil*.

His next point also quite agrees with "South India's" argument that we are all too much taken up with our own individual interests to bother about combination.

The second part of his letter in which he says undue prominence is given to the Labour Question, I cannot quite agree with.

I am quite with him that conditions vary in different Districts, but the time is coming when we will have to get over these differences and agree on some combined plan of campaign.

His second paragraph in this part of his letter bears out my own opinion and that of "South India" that there is no uniformity amongst planters of South India and it is high time they recognised it for themselves.

I now come to his first point in the third part of his letter, and my reply to this is, that if planters would air their views on practical planting in the *Chronicle* a little more freely than they do, this difficulty would be overcome.

A travelling assistant would mean a man who knew Coffee, Tea, Rubber and Cardamoms who would require a big salary besides travelling expenses which we cannot afford.

His concluding suggestion I am quite in sympathy with, and I think the U. P. A. S. I. is the medium for improving our labour conditions, but here again our rock of destruction is want of combination.

In conclusion I must say Mr. Barnard has brought forward some sound points which might be considered at the coming meeting of the U. P. A. S. I. with great advantage to the Planting Industry of Southern India.

Yours faithfully,
 "WANDERER."

Ten Drier.

The Managing EDITOR,
The Planters' Chronicle,
 Bangalore.

Dear Sir,—Can you or any of your readers inform me whether a tea drier heated by electricity has yet been invented or is at work anywhere? I should be grateful for any information.

Yours faithfully,
 WATU.

The Labour Problem.

THE EDITOR,
The Planters' Chronicle.

Sir,—The Chairman's letter to the Secretary, U. P. A. S. I. reproduced in your issue of the 9th instant, again shows the almost entire hopelessness of any agreement among S. Indian planters. Mr. Barnard in the same issue touches the chief reasons for this.

What strikes me most is the absolute futility of attempting to prevent emigration by any means except approximating conditions in S. India to those obtaining in other planting countries.

With the pay and other inducements held out to emigrate, can we expect that coolies will remain contented with the more moderate emoluments to be had on S. Indian Estates? Crimping letters and swindling maistries are *mere excrescences*—the real trouble for us is that there is a better market for the cooly's labour than our own. Indians are conservative to a point—and so, many still continue to go to estates they know, or are still unwilling to go too far from home; but the unchanging East is daily changing before our eyes, and returning emigrants are continually advertizing the advantages of emigration.

Mr. Abbott says that "Government may have to undertake an enquiry as to whether the drain of emigration can go on indefinitely, as Railways, Public Works, and the Forest Department are all suffering from a shortage of labour"—but what can Government do, save pay the market rates, and induce labour to stay in India? Is the liberty of the subject to be curtailed in order that certain Departments may be cheaply worked? As my interests are all in that branch of planting which I have often been assured "being the least remunerative will be the first to go the wall," I deeply regret the situation—but cannot see any hope of salvation in Government legislation or the Registration of Maistries. Ceylon seems to have had enough of legislation, which only worries and does not produce—and Travancore planters have just asked their Government to stop legislating. The Registration of Maistries is quite a respectable idea, and would probably have some effect in occasionally embarrassing a swindler; but will it affect the root of the evil? Will it stop the ordinary maistry from paying up his advances, and going elsewhere?

At last in Mysore we are feeling the pinch of emigration and competition and our coolies are going to "Malabar." So far, only a few rogues have left me, owing money to my maistries; but I hear from several others that honest men have *paid up their balances* and gone to Eldorado. How is Government or any one else to stop this, save by approximating the earnings of our labour to those of our rivals? Or are we to ask Government to make it difficult or impossible for our labour to go to "Malabar"? And what

would "Malabar" think of this? At the last meeting of the U. P. A. S. I. which I attended, I was told that if emigration could be stopped, we should have plenty of coolies. Quite so—but how to stop it? only by S. India offering inducements similar or superior to those of Malaya etc. Behind Mr. Martyn's up-to-date advertising must lie something solid to be advertised. Crimping will always go on—though if laws allow, and the Police develop morally, an occasional crimper will be punished, or a defaulter detected under Registration rules.

What, I ask, has ever been proposed to meet the real trouble, which is the superior attraction held out to labour over seas? I hear that in Malaya the Tamil cooly lives like a lord, goes to bazaar with his wife in a rickshaw pulled by Chinese, and imports Dramatic Companies for his delectation.

I honestly believe that the solution of the question will have to be by natural laws, and not by legislation. Things will have to level themselves. As the Chairman very sensibly writes, there will have to be a limit to expenditure in Malaya and elsewhere. The drop in rubber prices will work for us as well as against us—overlapping and other circumstances will help. On our part, I suppose we must help the solution by raising rates to suit the dearer times, so far as we are financially justified in doing so. Mysore must get on level terms with "Malabar," and S. India generally with its rivals. The result of this will no doubt be the elimination of the less productive properties. The survival of the fittest is a natural law. There is no doubt in my mind that in the days to come the poorer Estates must go, both here and overseas. Legislation can only deal with the excrescences—the dishonesties common to all walks of life—and we should not expect much from it. Government may refuse *indentured* coolies to other land, but it cannot do anything to stop emigration; and we cannot expect every cooly going abroad to be treated like a Siberian exile.

Yours faithfully,

(Signed) C. DANVEKS.

Freights.

THE EDITOR,

The Planters' Chronicle.

Bangalore.

Dear Sir,—In reply to "Curer's" letter in your issue of the 16th, I regret to see he thinks my query was in the light of a "Bomb." Your Editorial remarks have misled him. I was merely asking for some straight forward information, on a subject of general interest to us.

The rebate was on Freight.

The Account reads: "To Rebate paid by Bombay Steam Navigation Co., on Cwts.—2 shillings per 14 cwts.... etc.

The Coffee was shipped from the West Coast.

In your issue of August 2nd "Curer" states that "The question of Freight Rebates was more or less laid to rest in 1894, I think chiefly because if not more of the agitators realised the equity of the Curers position in regard to these freight returns."

Others besides Mr. Graham, to whom "Curer" offers explanations, must have been at school at this remote date. Will not "Curer" give the "Younger Generation" some enlightenment?

If other Steamship Lines pay these rebates, are we not entitled to some explanation as to why our "Agents" (?) pocket them?

Yours faithfully,

SLEEPING BROTHER.

PEPPER.

The Annual Report of the Taliparamba Agricultural Station contains an interesting account of various manurial experiments with Pepper. Though there was a poor crop during the year under report, and the majority of the experimental plots gave a yield below that obtained in 1911-12, the plot which is treated with Lime and Leaf mould showed an increase over the last year's crop. The plot manured with fish is doing well, the plot treated with ashes responded in the first year or two of application but has steadily deteriorated within the last few years. A comparative test between Gingelly Oil-cake and cattle manure shows that the cake is not so lasting as the latter and the vines on the plot receiving cake do not recover after years of heavy bearing. The plots receiving Leaf mould and Leaf mulch are both doing well. On the latter a mulch of fresh leaves is spread over the ground at the end of the season and this is allowed to rot during the next monsoon when it is dug in. The vines stand the hot weather much better than on most plots owing to the complete ground protection.

Experiments with different methods of cultivation show that mounding has only a temporary beneficial effect. The only green manure which appears to be any good for Pepper is ground nuts. These are sown at the beginning of the monsoon and the plants dug in before the rains cease. An interesting experiment is being conducted with Pepper grown on posts connected by cross poles to a trellis about eight feet high on which the vines are trained. They are heavily manured every year by digging a trench alongside the line of trellis and manuring heavily with a mixture of Lime, Leaf mould, and Fish manure after which the trench is filled in. The trench is dug one year on one side of the trellis and the next on the other side. The manuring was begun when the vines were three years old and has now been carried on for the last three seasons.

The results obtained at Taliparamba are very interesting but there appear to be no control plots with which the results of the use of different manures can be compared. This detracts considerably from their value from a planter's point of view as does also the fact the rate of application of the various manures is not stated. For anyone wishing to repeat the work at Taliparamba on an estate on a large scale there is little information in the Report to enable him to do so.

Ceylon.**RUBBER EXPORTS.**

The following statistics of the exports of rubber of domestic production from Ceylon during the month of April and the four months ended April, 1912 and 1913, have been extracted from official returns issued by the Ceylon Government.

To	April 1912.	April 1913.	Jan.-April 1912.	Jan.-April 1913.
	Lbs.	Lbs.	Lbs.	Lbs.
United Kingdom ...	404,495	646,445	2,345,148	3,726,888
United States ...	261,084	356,290	1,396,629	2,509,802
Other countries ...	67,970	387,962	636,581	1,399,526
Total exports of rubber of domestic production..	733,549	1,390,697	4,378,358	7,636,216

The Board of Trade Journal.